MANPRINT BULLETIN

Vol. III No. 2 September/October 1988

MANPRINT/Industry Executive Seminar Held

Wayne Higbe
Automation Research Systems, Ltd.

Forty government and industry representatives attended the MANPRINT/Industry Executive Seminar held on September 15, 1988 in Alexandria, Virginia. The event was hosted by Army Deputy Chief of Staff for Personnel (DCSPER) LTG Allen K. Ono; the keynote speaker was GEN Arthur E. Brown, Jr., Vice Chief of Staff of the Army. The objectives of the conference were to emphasize the continuing importance of MANPRINT to the U.S. Army; illustrate a successful application of MANPRINT by industry; and to elicit industry feedback. Equal representation from both responsible government agencies and primary DOD contractors provided the opportunity to compare experiences, issues, and perceptions in the implementation of MANPRINT.

LTG Ono opened the seminar by explaining both the purpose and objectives for the seminar. GEN Brown, in his keynote speech, emphasized the continuing importance of the program by presenting interesting vignettes on successful applications of MANPRINT. GEN Brown stressed that congressional and Army leadership interest demands that the Army support its soldiers with operable equipment. He further stated that although MANPRINT achievements and progress have been noteworthy for the past four years, many challenges—in particular, institutionalization of the program— remain for both government and industry. GEN Brown concluded by pointing out that MANPRINT is a high value, high payoff program that impacts on warfighting capability and that industry and government cooperation is mandatory for success.

Government-led seminar topics were presented following the keynote address. Presentations included updates on the status of MANPRINT policies and procedures, MANPRINT in the Request for Proposal (RFP) and source selection processes, new MANPRINT analytical support tools, and MANPRINT initiatives at both the Army's Human Engineering Laboratory (HEL) and the Army Re-

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INSIDE...

"Remember the Soldier"

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search Institute for the Behavioral Sciences (ARI). Many issues were raised during these briefings, including industry's ability to obtain, review and comment on draft requirement documents; funding for MANPRINT-related industry research and development (IR&D); MANPRINT analysis of new systems' components; the need for more analytical tools for measuring soldier effectiveness; and the ability to analyze for MANPRINT factors during early development and the more formal test and evaluation process. Seminar participants agreed that more cooperation is necessary in order to increase soldier involvements in modeling, simulation, and system demonstration and testing.

The remainder of the seminar agenda stressed industry response to the MANPRINT policies, procedures, and integration into materiel acquisition. BMY, the prime contractor for the Howitzer Improvement Program (HIP), presented a thorough and informative briefing on the application of MANPRINT to their program. The BMY representative explained how MANPRINT was instituted in his corporation, how the program impacted on the HIP system design, as well as how MANPRINT was tied to other program elements. He also stressed the absolute need for user/developer dialogue early in the program and the importance of using existing analytical output during program decision reviews. The presentation concluded with recommendations to both government and industry on how to initiate and maintain a successful MANPRINT program.

An open forum session chaired by Dr. Harold Booher, the ODCSPER Director for MANPRINT followed the industry presentation. MANPRINT issues needing more definition and topics that should be addressed at future seminars were outlined. The session included discussions of the need to show actual MANPRINT impacts on contract awards; the increased role and means to insert MANPRINT in 6.2 and 6.3A early development; the contractor's role in defining the complete force structure implications of the fielded system; the value of supporting the initial cost of MANPRINT analysis weighed against long-term operational and support cost savings; consistency in MANPRINT application and guidance; and funding support for developing more analytical tools.

The conference closed with participants agreeing that future seminars designed to address and resolve the existing issues and concerns will promote the successful integration of MANPRINT into the materiel acquisition process. According to GEN Brown, in remarks made after the close of the conference, "The important outcome of a seminar is reflected in the action that flows out of it. It is now incumbent upon the Army and industry to increase MANPRINT emphasis. We've got to work harder."

For more information, contact LTC Rudy Laine, HQDA (DAPE-MR), Washington, DC 20310-0300; telephone AV 225-9213 or COM (202) 695-9213.

ANNOUNCEMENTS

HFE Articles Wanted: The January/February 1989 issue of the MANPRINT Bulletin will focus on Human Factors Engineering. Our readers are invited to submit HFE-related articles for publication. Please send 2-3 page, double-spaced drafts to Automation Research Systems, Ltd., ATTN: Ms. Nan B. Irick, 4401 Ford Avenue, Suite 400, Alexandria, VA 22302 or to HQDA (DAPE-MR), Washington, D.C. 20310-0300. All articles must be edited to Bulletin format; therefore, any submitted material must be received by 15 December 1988 for consideration.

MANPRINT Success Stories Wanted: The MANPRINT Bulletin is interested in printing articles on successful MANPRINT applications. If you have a "success story" that you feel would be of interest to others in the MANPRINT community, please send your double-spaced draft--confined to two or three typed pages-- to the above ARS address, ATTN: Ms. Nan B. Irick, or to HQDA (DAPE-MR), WASH DC 20310-0300.

POC List Update: The MANPRINT Points of Contact List is in the process of being updated. Please send any changes, additions, or deletions by 1 December 1988 to Automation Research Systems, Ltd., ATTN: Ms. Kristy Underwood, 4401 Ford Avenue, Suite 400, Alexandria, VA 22302, or telephone (703) 820-9000. Please include old address information with the update.

MANPRINT Training: MANPRINT training course description packets may be obtained by contacting Ms. Kristy Underwood at the above ARS address.

Preparing a Health Hazard Assessment Report

LTC Bruce C. Leibrecht
U.S. Army Aeromedical Research Laboratory

Editor's Note: This is the fourth in a series of articles on the Army's Health Hazard Assessment Program. The final article in this series will look at biomedical research supporting the Health Hazard Assessment Program.

How does a Program Manager obtain an official evaluation of a system's health hazards? He or she requests a Health Hazard Assessment Report (HHAR) from The Surgeon General's Office. The HHAR embodies a standardized, systematic methodology for evaluating the health risks of materiel systems. By providing a specified structure and common elements of information, the HHAR helps ensure comprehensive medical input consistent across the spectrum of Army systems.

The goal of the health hazard assessment process is to determine which, if any, of a system's potential health hazards poses a serious threat to personnel and what corrective/preventative measures should be taken. AR 40-10 defines the standard format for the HHAR, which is designed to document clearly the logical process by which recommended actions are developed. The following table represents the prescribed format.

HHAR Format

Paragraph	Contents
1. References	Listing of source materials
2. Summary	Executive overview
3. Background	System description, predecessor system, usage scenario(s), prior assessments
4. Identification of Issues	Component based inventory of potential/actual hazards
5. Assessment of Issues	Data analysis and conclusions vis-a-vis health standards
6. Recommendations	Recommended actions for hazard control, with risk assessment codes
7. Preparer ID	Organization, POC, date prepared

To accommodate the lack of empirical data characteristic of a system's early development, AR 40-10 defines two types of HHARs. The Initial HHAR (IHHAR) comes into play during the concept exploration and early demonstration/validation or proof of principle phases. This report covers the health hazards waterfront generically, identifying potential hazards and pertinent health standards based on fairly gross information about the system. During later phases of development, as system prototypes and actual test data emerge, the regular HHAR provides a reasonably definitive accounting of actual or prospective hazards. In the IHHAR, recommended actions tend to focus on future data requirements, while recommendations in the HHAR typically specify corrective or precautionary actions. The flexibility afforded by the IHHAR enables early involvement in the development cycle, a cardinal principle in the MANPRINT Program.

What key ingredients are essential in preparing an HHAR? In general terms, two types of information must be available—descriptive and quantitative information about the system itself, and health standards against which to judge the health-threatening characteristics of the system. Descriptive information should include a comprehensive accounting of components; subsystems; special materials; simulators and other training devices; special support and maintenance equipment; and special salvage or disposal equipment. Also important is a complete description of how the system will be employed—operating/training doctrine, logistics support concepts, NBC requirements, and environmental conditions expected to be encountered. Obviously, considering the complete life cycle of the system is imperative.

Quantitative information about the system will include hazard-related data (e.g., noise and vibration signatures) from technical testing, user testing, special hazard evaluations, previous health hazard assessments, mishap reports, safety incidents, and sometimes modeling efforts. In the case of an IHHAR, only data from a predecessor system may be available, or perhaps none at all. In the absence of quantitative data, definitive statements about levels of risk are impossible.

Health standards provide the yardsticks with which to guage the severity of quantified hazards. These standards can take several forms: medical exposure limits, health conservation standards, and materiel design standards. Rules, both formal and informal, for applying these standards are necessary

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to ensure relevance and consistency. Though often unavailable, comprehensive biomedical databases are very helpful in guaging real levels of risk, especially when quantified hazards exceed established limits.

Once the necessary ingredients are on hand, what steps does a medical evaluator follow in developing an HHAR? Depicted in the figure below is an idealized sequence of steps characterizing the preparation process.

The foundation of the HHAR Process is the careful analysis of the physical system and the doctrine for its utilization. All components and subsystems; all phases of the system's life cycle; all personnel who will interact with the system; special operating conditions; and anticipated environmental conditions provide important clues to potential health hazards. From this system-based analysis comes a comprehensive inventory of hazardous entities which could reasonably be expected to place personnel at risk.

The medical evaluator next analyzes the quantitative data available for each hazard inventoried. The quality and completeness of the data are determined first; any serious deficiencies that are identified will prompt recommendations for future data collection. Raw or intermediate data may need to be reduced, converted to different units of measure, or reorganized to one suitable for interpretation. Those data inadequate for interpretation are compared to pertinent health standards to ascertain whether the quantified levels are acceptable given the frequency and duration of exposure expected from relevant scenarios. The effects of any required or available protective equipment must be accounted for in determining effective exposure profiles.

The next step is to estimate the degree of risk associated with each hazard by assigning a risk assessment code (RAC); this is useful in establishing priorities for control actions. Two factors determine the actual RAC—hazard severity and hazard probability. Hazard severity is defined in terms of degree of injury, occupational illness, or system damage which could result. Categories of severity include: negligible, marginal, critical, and catastrophic. Hazard probability reflects the likelihood of occurrence, ranging from impossible to frequent. The RAC integrates both hazard severity and probability to yield a number between 1 and 5, with 1 reflecting the highest degree of risk.

Based on the analysis of each standard, the medical evaluator next formulates recommended actions to reduce, control or eliminate hazards posing unacceptable degrees of risk. The types of control options available appear in the following table.

Health Hazard Control Options
• Protective devices (e.g., helmets, etc.) • Occupational health monitoring (e.g., audiometric testing) • Administrative controls (e.g., training limitations) • Operational constraints (e.g., duration or frequency) • Personnel selection criteria (exclusion of high-risk personnel) • Systems modifications (e.g., retrofitting)

For each hazard representing unacceptable risks to personnel, there should be one or more control measures recommended. Selection of control options must be tailored to the specific system and its operational requirements. More than one type of control option may be necessary for some hazards. Likewise, both short and long-term measures may be necessitated by practical considerations.

By the time recommended actions have been formulated, the bulk of the work on the HHAR is done. The major effort is to commit the results of the foregoing steps to paper, using the prescribed format. This may involve merging inputs from multiple organizational elements sharing the task of preparing the HHAR. The final step in completing the HHAR consists of staffing and approval by the Office of The Surgeon General. When the latter step is finished, the HHAR is ready for delivery to the requesting Program Manager.

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MANPRINT Through Logistic Support Analysis

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USAMC Materiel Readiness Support Activity

The 11 April 1983 revision of MIL-STD-1388-1A, LSA (Appendix A, paragraph 40.2.1) states that, "Demographics indicate the current problems with manpower and personnel shortages (both in terms of quantity, skills, and skill level) will continue. The problem is of such magnitude that it must be approached through the design process as well as the more traditional manpower and personnel approaches. New system equipment manpower quantities and skill level demands must be managed like other major design parameters beginning with the earliest conceptions of the new system." This awareness led to incorporation of explicit provisions for achieving MPT MANPRINT goals into MIL-STD-1388-1A prior to the Oct 1984 initiation of the Army's MANPRINT program. LSA is a set of iterative, analytical tasks that aid in accomplishing Integrated Logistics Support (ILS) objectives; the most critical of these objectives is influencing system design up front to ensure supportability and affordability.

Many LSA tasks are first performed in the preconcept phase to develop logistic input for program initiation and requirements documents. LSA Task 201, Use Study, examines the system's intended use and determines the implications for MPT and other ILS elements. The Use Study identifies factors such as operating requirements; reliability, availability, and maintainability requirements; operational environment(s); existing support structure; capabilities and limitations of available operating and support personnel; and manpower constraints.

LSA Task 203, Comparative Analysis, also initiated in the pre-concept phase, requires development of Baseline Comparison Systems (BCS) representing the characteristics of system alternatives. The BCS is used to project supportability parameters for each alternative and to identify problems with comparative systems that should be avoided with the new system. Early estimates of Army personnel's ability to perform required operations and maintenance tasks, and early indications of tasks that will be "high drivers" in terms of MPT requirements, are derived from analyses of the BCS. The information generated, that is, the estimated MPT cost of each system/subsystem option, is considered when choosing between design alternatives. The hardware versus Manpower and the Early Comparability Analysis techniques are methodologies for performing LSA Task 203.

LSA Task 301, Functional Requirements Identification, is used early in the concept exploration phase to identify the broad functions that must be performed to operate and maintain each system alternative. This information is used to identify functional requirements which are new or unique due to new technology or operational concepts (and may therefore require new skills); functional requirements which are supportability, cost, or readiness drivers; risks involved in satisfying the functional requirements; and design alternatives which will correct deficiencies identified. As the system design is refined, LSA Task 301 is used to identify all detailed tasks required to operate and support the system in its intended environment(s).

LSA Task 303, Evaluation of Alternatives and Tradeoff Analysis, helps to determine the system design and the support system alternatives that represent the best balance between risk, cost, schedule, performance, readiness, and support phase. MIL-STD-1388-1A stipulates that manpower, skill level, and personnel cost constraints be input to the tradeoffs, which begin early in the concept exploration. LSA Task 303 requires the MPT implications of system design alternatives be estimated in terms of manpower, skill level, training and experience required. Tradeoffs between design, operations, training and job design to determine the optimum solution for attaining and maintaining the required proficiency of operating and support personnel are also performed as part of LSA Task 303.

LSA Task 205, Supportability and Supportability Related Design Factors, begins during concept exploration. This task consolidates the results of other LSA tasks and translates them into specific design constraints and requirements for the new system. These constraints are input to requirements documents and system/development specifications, and become the measuring stick against which the

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LSA *(continued from page 5)*

design is evaluated. Per MIL-STD-1388-1A, these requirements include training time constraints; manpower and personnel constraints; and MANPRINT-related maintainability constraints such as mean time to repair.

LSA Task 401, Task Analysis, requires that all operations and maintenance tasks identified through LSA Task 301 be analyzed to determine the specific support resources, procedures, steps, and performance standards associated with each task. This detailed analysis, which generally begins early in the full-scale development phase, serves as the basis for determining actual MANPRINT requirements versus predetermined constraints. Any task or combination of tasks that exceed established contraints are flagged and design solutions are formulated. LSA Task 401 also provides a mechanism for verifying that soldiers with specified training, skills, and mental aptitudes will be able to adequately accomplish operation and maintenance tasks through actual performance of those tasks on prototype equipment by target audience soldiers.

Other MIL-STD-1388-1A tasks also contain provisions for ensuring achievement of established requirements. LSA Task 103, Program and Design Reviews, requires that compliance with supportability related design requirements be tracked and evaluated at program and design reviews throughout the life cycle. LSA Task 501, Supportability Test, Evaluation, and Verification, involves planning and conducting tests that assess the achievement of specified MPT and other supportability requirements; evaluating test results; and taking necessary corrective action. This task begins in the concept exploration phase to develop an overall test and evaluation strategy.

The LSA Record (LSAR) is described in MIL-STD-1388-2A, DOD requirements for a Logistic Support Analysis Record. The LSAR is generally not initiated until late in the demonstration and validation phase. Prior to this, LSA documentation consists of a series of reports detailing the analyses conducted and their results. These reports constitute LSA documentation in the all important early life cycle phases when design influence is most critical. Appendix A, Table III of MIL-STD-1388-1A contains a listing of the Data Item Descriptions for these reports.

The LSA process fulfills a significant portion of the analytical requirements related to the MPT domains of MANPRINT. MANPRINT has highlighted areas, however, in which LSA must be enhanced. The USAMC Materiel Readiness Support Activity is forming an Army-wide functional working group to develop changes to the MIL-STD-1388-1A and MIL-STD-1388-2A which will increase MANPRINT coverage. The Nov/Dec issue of the Army RD&A Bulletin will contain additional information concerning the interface between LSA/LSAR and MANPRINT.

For more information, contact Commander, USAMC Materiel Readiness Support Activity, ATTN: AMXMD-EL, Lexington, KY 40511-5101, AV 745-3985, or COM (606) 293-3985.

MANPRINT Primer Now Available from DTIC

The MANPRINT Primer has been approved for public release. Assigned AD# A197 681, this publication may be obtained by contacting the Defense Technical Information Center, Cameron Station, Alexandria, VA 22304-6145. Telephone (202) 274-7633.

HHAR *(continued from page 4)*

As a major mechanism for effectively integrating human considerations into materiel acquisition, the HHAR is a key tool in the MANPRINT Program. To be optimally effective, it should be applied in concert with other MANPRINT tools (e.g., the Human Factors Engineering Analysis), not in isolation. There must be careful coordination and interaction between health hazard assessment activities and efforts of the other MANPRINT domains to ensure cohesive, comprehensive, and efficient program coverage. The MANPRINT Joint Working Group forms the primary body for integrating the HHAR throughout all MANPRINT domains. Finally, the formal materiel acquisition decision body (i.e., ASARC, IPR) is responsible for verifying that a proper HHAR is completed and that appropriate action is taken to resolve health hazard issues.

For additional information, contact LTC Bruce Leibrecht, U.S. Army Aeromedical Research Laboratory, P.O. Box 577, Fort Rucker, AL 363-5292, AV 558-6800 or (205) 255-6800.

SIMNET in Support of the MANPRINT Effort

Kathleen A. Quinkert, Ph.D. and Barbara A. Black, Ph.D.
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and
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Predictive methods of analysis available for use early in the design process (such as MIST and HARDMAN) fail to provide sufficient information concerning soldier performance or man/machine interaction. To address questions of this type, soldier-in-the-loop simulation, similar to that used in high-fidelity training devices, may prove to be a safe and cost effective approach.

When soldier performance is a critical factor in a new design, simulation can provide the realistic task-loaded environment necessary for evaluation and concept exploration without the costly errors associated with a fully designed/prototyped system. The value of the simulation is further enhanced if simulator construction allows rapid prototyping of candidate systems, followed by user testing. Such capabilities could serve as a key resource for addressing MANPRINT operator performance issues.

The Defense Advanced Research Projects Agency (DARPA) is focusing its efforts on such a capability by supporting a series of technology demonstrations referred to as SIMNET, or simulation networking. The Abrams M1 tank was selected for case demonstration, and both local area networking and distributed processing were employed. Modular crew compartments designed for a company-level team have been successfully networked to operate on common simulated terrain. Exercises can be conducted force-on-force, or against a semi-automated opposing force. The training facility (SIMNET-T) will, when fully equipped, allow collective simulated operation of combined arms units up to the size of a tank task force. Initial demonstrations have already produced a number of encouraging applications for the Army, ranging from tactical maneuver training under operational (miles, hours) constraints, to combat development questions, without running resource-intensive field experiments.

Developmental SIMNET (SIMNET-D), one of several technological breakthroughs associated with the DARPA effort, offers a viable approach for investigating soldier operator issues. SIMNET-D realistically represents potential soldier-machine interfaces via rack-mounted displays, controls, and specially developed modular software packages. Its capability for rapid reconfiguration, unobtrusive observation, exercise replay, and expedient data capture and analysis allows accurate and objective soldier-in-the-loop performance measurement and evaluation. In short, it provides the means by which selected MANPRINT issues and concerns may be addressed and resolved.

Although SIMNET-D was not designed exclusively as a MANPRINT tool, it could be instrumental in bridging the gap between a logical concept and an operational goal. For example, it can provide up-front information on the workload impact of a new design, as well as the soldier skills required for operation. Optimum organization structures, manpower requirements, and equipment density and distribution can then be ascertained. Component characteristics and crew stations could be reconfigured as dictated by continuing human factors engineering analyses, as well as evaluated for overt safety hazards. Early determination of training requirements would give training developers considerable time to identify, develop, and evaluate new techniques, strategies, and aids.

SIMNET use during the Concept Exploration phase of the Life Cycle Systems Management Model (LCSMM), or during the Proof-of-Principle phase in the Army Streamlined Acquisition Process (ASAP), could provide a unique up-front capability. In these initial phases, there is sufficient time to allow the design-test-design paradigm to pass through several iterations. This process can run three to six months depending on the number of issues addressed within a given effort. This is relatively fast when considering how long it takes to build even a plywood mock-up. Though SIMNET would be useful for examining most major systems under development, it may not be appropriate for evaluating Non-Developmental Items (NDI). Because the hardware already exists, recon-

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SIMNET *(continued from page 7)*

figuring simulators would be duplicative. With an NDI add-on capability, however, SIMNET-D could be used to determine how the item might be integrated into operational systems.

The usefulness of SIMNET-D output, from a MANPRINT standpoint, falls primarily into two categories: 1) as a quantitative or qualitative input for other MANPRINT methods or techniques or 2) as a research product in and of itself to be used as the basis for MANPRINT system decisions. While SIMNET-D may provide a new MANPRINT analytic capability, it should not be viewed as a panacea for addressing all problems. Maximum benefits can be achieved from SIMNET-D when it is used in conjunction with other MANPRINT methods and analytic tools.

The SIMNET developmental and training facilities are located at Fort Knox. Use of the facilities must be arranged through the process outlined in the DARPA-Army Memorandum of Understanding (July 87). Study group and task force level research has first priority; however, smaller scale projects can be arranged to run concurrently with those of higher priority, depending on resourcing and level of effort required.

Further information concerning SIMNET-D scheduling can be obtained by contacting Michael A. Johnson, Chief, Technical Support Branch, Analysis and Technical Support Division, AV 464-6673, or COM (502) 942-6747.

SODD'S LAW:

Sooner or later, the worst possible set of circumstances is bound to occur.

Corollary:

Any system must be designed to withstand the worst possible set of circumstances.

Courtesy of Murphy's Law, 1979.

IMPACTS:
The Air Force's Answer

Major Elaine Howell
Air Force Systems Command
and
Dr. Larry Howell
Automation Research Systems, Ltd.

IMPACTS (Integration of Manpower, Personnel, and Comprehensive Training and Safety) is the new Air Force program designed to emphasize manpower, personnel, training, and safety factors throughout the entire weapons systems acquisition process (WSAP). IMPACTS, a recent change of direction in both name (formerly RAMPARTS) and program concept, has come about as the culmination of more than twenty years of effort to improve the human planning asociated with the WSAP. The name was changed to show the program's emphasis on the integration, the key word in the concept. The IMPACTS program will become effective as soon as a Memorandum of Agreement (MOA), now in draft, is signed.

The Air Force recognizes that a significant part of its warfighting capability comes from the ability to translate technology into advanced weapon systems. To efficiently design, build, operate and maintain these combat systems, a complete systems approach to the acquisition process must be considered. A life-cycle cost analysis at the front end of the WSAP, including human elements of supportability and operability, can help generate smarter acquisition decisions that will minimize reliability and maintainability problems.

Air Force weapons systems continue to require ever more highly trained and skilled operators and maintenance experts. The quality people needed continue to cost more to recruit, train, and retain. The challenge for the Air Force is to design and build supportable weapon systems, and have people trained and ready to operate those systems when they first become operational; this is especially important because the costs involved with operating and maintaining weapon systems usually far outweigh the cost of the initial acquisition.

Although the Air Force made a concerted effort in the past to include human factors in the acquisition process, until now it has not had a dedicated focal

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point to give central control and guidance to the program. Even though various analytical tools were developed to assess manpower and training requirements, integration of manpower, personnel, training and safety has not been given enough emphasis early in the acquisition process. Consider this:

- Changing a dead battery in the F-4 requires five different specialties and seven tasks because the battery is located under the ejection seat.

- The requirement for the radar trainer for the E-3A was identified in 1974, yet the equipment was not delivered until the fall of 1983. In the interim, the Air Force paid $3 million a year for contract training. Had we bought the trainer on time we could have saved $9 million.

- Changing scenarios for the A-10 deployment location from one-base to two-bases required an additional 165 manpower slots. This requirement, however, was not coordinated early enough to have those trained people available for the first two overseas deployment exercises.

- The Air Force was slow to identify total B1-B requirements for weapons load trainers. As a result, they had to use operational aircraft for weapons load training. The B1-B is an awfully expensive and fragile piece of training equipment!

- A recent deployment of 24 F15 aircraft required over 600 maintenance personnel in 22 different specialties and included an Avionics Intermediate Shop (AIS). This deployment required 21 C-141s to carry the people and equipment required to operate for 30 days from a prepared site.

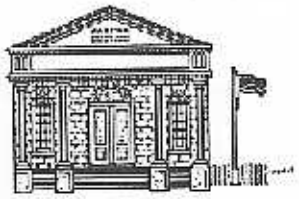
As a result of these and other problems, the Air Force has had both internal and external scrutiny of its MPTS efforts. In1986, the Air Force established a new model organization at Wright-Patterson Air Force Base to provide a core of manpower, personnel and training specialists to assist the various System Program Offices in applying MPT research tools to better plan MPT integration in the WSAP. The FY87 Authorization Bill, passed by the Senate Armed Services Committee, requires the Secretary of Defense to submit a report to Congress detailing manpower requirements associated with a new weapon system at least 90 days prior to the full scale development decision. In 1987, the Assistant Secretary of Defense for Force Management and Personnel coordinated a joint service working group to review the congressional language and stress high-level support for increased MPTS planning.

Following the Air Force Human Resources Laboratory's Air Force/Industry MPT Conference held in May 1987, the Air Force Systems Command commander created a colonel-level planning committee to study the need for MPT planning change in the Air Force. This committee recommended the implementation of the IMPACTS program, and set four basic objectives: (1) expand the MPT model organization to all systems command product divisions, (2) increase emphasis on the MPT elements in the Integrated Logistics Support (ILS) concept, (3) institutionalize MPTS in the systems engineering process, and (4) establish high-level, top-down support for the program.

The IMPACTS program is based on a three-level structure, with oversight by a central steering committee. An IMPACTS Working Group, chaired by the Secretary of the Air Force for Acquisition, will act as the approval and review authority for all MPTS/IMPACTS documentation. Existing Training Planning Teams at each systems program office will be expanded by manpower, personnel, safety, and human factors expertise into IMPACTS Planning Teams. The existing Training Development Plan will become an IMPACTS Program Plan (IPP), which will serve as the sole source for MPTS data for the program. Each Major Command will appoint IMPACTS focal points to serve as information conduits to the steering committee and the working groups; these focal points will ensure the major commands present an integrated stand on MPTS issues.

With a greater emphasis being placed on a complete systems approach to acquisition, system supportability will receive equal scrutiny with cost, schedule, and hardware performance during source selection and design trade-offs. The Air Force should be able to avoid most of the MPTS problems that have plagued its systems in the past. IMPACTS: **it's about time!**

For more information about IMPACTS, contact Major Elaine Howell, AFSC/Andrews Air Force Base, MD 20334, (301) 981-1556, or Dr. Larry Howell, Automation Research Systems, Ltd., 4401 Ford Avenue, Alexandria, VA 22302, (703) 820-9000. (P.S. No, they're not!)



Schedule of MANPRINT Courses for FY88/89

MANPRINT Senior Training Courses

14 Nov - 18 Nov 88 (St. Louis, MO)
09 Jan 89 - 13 Jan 89 (Ft. Rucker, AL)
13 Feb 89 - 17 Feb 89 (Rock Island, IL)

MANPRINT Staff Officers Courses**

17 Oct 88 - 04 Nov 88	6 Mar 89 - 24 Mar 89
28 Nov 88 - 16 Dec 88	03 Apr 89 - 21 Apr 89
23 Jan 89 - 10 Feb 89	01 May 89 - 19 May 89

**All courses will be held at the Casey Bldg., Humphrey's Engineer Support Activity Complex, Ft. Belvoir, VA.

MANPRINT INFORMATION

POLICY - MANPRINT Directorate, HQDA (DAPE-MR). Washington, DC 20310-0300. AV 225-9213, COM (202) 695-9213.

MANPRINT TRAINING - Soldier Support Center-National Capital Region, ATTN: ATNC-NM, 200 Stovall St., Alexandria, VA 22332-0400. AV 221-3706, COM (703) 325-3706.

PROCUREMENT & ACQUISITION - US Army Materiel Command, ATTN: AMCDE-PQ, 5001 Eisenhower Ave., Alexandria, VA 22333-0001. AV 284-5696, COM (202) 274-5696.

HUMAN FACTORS ENGINEERING STANDARDS AND APPLICATIONS - Human Engineering Laboratory - MICOM Detachment, ATTN: SLCHE-MI, Redstone Arsenal, AL 35898-7290. AV 746-2048, COM (205) 876-2048.

MANPOWER, PERSONNEL AND TRAINING RESEARCH - Army Research Institute, ATTN: PERI-SM, Alexandria, VA 22333-5600. AV 284-9420, COM (202) 274-9420.

17-19 October 1988

Association of the United States Army (AUSA) Annual Meeting. Sheraton Washington, Washington, D.C. Registration forms can be obtained from *Army Magazine* or from Chapter points of contact. For exhibit information, contact Joe Hollis, AUSA, (703) 841-4300, ext. 667.

24-28 October 1988

"Riding the Wave of Innovation," 32nd Annual Meeting of the Human Factors Society. Anaheim, CA. Contact: Human Factors Society Central Office, P.O. Box 1369, Santa Monica, CA 90406. Telephone: (213) 394-1811.

29 November - 1 December 1988

Interservice/Industry Training Systems Conference, "Combat Readiness Through Training." Orlando, FL. Contact: Interservice Training Systems, Naval Training Systems Center, Orlando, FL 32813-7100. Telephone: (305) 646-4500.

GENERAL INFORMATION

• Proposed articles, comments, and suggestions are welcomed, and should be mailed to: MANPRINT Bulletin, ATTN: HQDA (DAPE-MR), Washington, D.C. 20310-0300. Telephone: AV 225-9213, COM (202) 695-9213.

LTG Allen K. Ono, Deputy Chief of Staff for Personnel

Mr. Harry Chipman, ODCSPER Coordinator

Ms. Nan B. Irick, Editor, ARS

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